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DATA SHEET: 93.5 Lead-1.5 Silver-5Tin

Physical Properties of Bulk Solder

Solder Alloy Composition	95Pb-3.5Sn-1.5Ag (weight per cent)
Melting range	300-304°C
Density	11.13 Mg/m ³
Thermal conductivity	0.21 W/cm K ⁻¹
Electrical conductivity	5.1% IACS
Coefficient of Thermal Expansion	25.0 x 10 ⁻⁶ K ⁻¹
Tensile strength (est.)	30 GNm ⁻²
Bonding strength	18 GNm ⁻²

Typical impurity levels for electronic grade are less than:

Au: 0.05	Cu: 0.08	Ni: 0.01	Al: 0.0005
Bi: 0.001	Fe: 0.02	Zn: 0.0003	As: 0.0003
Cd: 0.002	In: 0.10		

Application: The 95Pb3.5Sn1.5Ag-alloy is used for the manufacture of semiconductor components. It combines a higher melting range, with good mechanical strength and thermal fatigue properties. The 3.5% tin and the 1.5 Ag additions assure a good wetting to copper leads and Au-flash coated Si-chips in die-attach applications. The melting temperature range is high enough to permit two- or even three-step soldering. The higher melting range makes the alloy also very suitable for fluxless soldering in an inert or reducing atmosphere.

The 3.5% Sn solder is a high-temperature silver-bearing solder with good thermal fatigue properties. It is used in the assembly of diodes and rectifiers in belt furnaces with a forming gas mixture (N₂, H₂) or cracked anhydrous ammonia (75%H₂, 25%N₂).

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